

AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A process of replacing nucleus pulposus of an intervertebral disk, comprising:

~~identifying a location of a rupture in an annulus fibrosus of an intervertebral disk;~~

removing nucleus pulposus associated with [[said]] an annulus fibrosus of [[said]] an intervertebral disk; and

injecting a thermoplastic material heated to a temperature over 50 C. for flowing into said annulus fibrosus and then permitting said material to cool for setting in a non-flowing state upon reaching a temperature of between 35 C. and 42 C., so as to cause said material to occupy a space formerly occupied by said removed nucleus pulposus.

Claim 2 (original): The process as defined in claim 1, further comprising:

providing an injection device for injecting the thermoplastic material, the injection device having a heating element and a needle for dispensing of the thermoplastic material;

heating the thermoplastic material by said heating element to a predetermined high temperature over 50 C. at which said material flows a desired amount; and

thereafter injecting said thermoplastic material at said predetermined high temperature through said needle for flow into said annulus fibrosus of said selected intervertebral disk.

Claim 3 (original): The process as defined in claim 1 wherein injecting a thermoplastic material includes injecting gutta percha heated to a temperature over 50 C. for flowing of said gutta percha into said annulus fibrosus.

Claim 4 (original): The process as defined in claim 1 wherein injecting a thermoplastic material includes injecting a gutta percha compound including zinc oxide and heated to a temperature between about 150 C. and 200 C.; and

cooling said gutta percha compound by body temperature to about 37 C. for setting of said gutta percha compound in a non-flowing state with sufficient resilience to provide adequate cushioning.

Claim 5 (original): A process of injecting a thermoplastic material within an annulus fibrosus of a selected intervertebral disk of a patient comprising:

selecting said intervertebral disk in which said thermoplastic material is to be injected;
providing an injection device for the thermoplastic material having a heating element for the thermoplastic material and a needle for dispensing of the thermoplastic material;

heating the thermoplastic material by said heating element to a predetermined high temperature at which said material flows a desired amount;

thereafter injecting said thermoplastic material at said predetermined high temperature through said needle for flow into said annulus fibrosus of said selected intervertebral disk; and

cooling said thermoplastic material to the body temperature of the patient for setting of said thermoplastic material in a non-flowing state with a resilience to provide desired cushioning.

Claim 6 (original): The process as defined in claim 5, further comprising:

removing nucleus pulposus from said annulus fibrosus prior to injection of said thermoplastic material wherein said thermoplastic material occupies a space formerly occupied by said nucleus pulposus.

Claim 7 (original): The process as defined in claim 5 wherein:

selecting said intervertebral disk includes selecting an intervertebral disk at the apex of a abnormal curvature of the spine of the patient; and

then injecting said thermoplastic material at said predetermined high temperature into the annulus fibrosus of said selected disk.

Claim 8 (original): The process as defined in claim 5 wherein:

injecting a thermoplastic material includes injecting gutta percha heated to a temperature over 50 C.

Claim 9 (original): The process as defined in claim 5 wherein:

Injecting a thermoplastic material includes injecting gutta percha heated for flowing at a temperature between about 150 C. and 200 C.; and
cooling said gutta percha by body temperature at about 37 C. for setting in a non-flowing state.

Claim 10 (original): A process for treating scoliosis of the spine at the greatest deflection of the concavity of the spine formed by the abnormal curvature comprising:

selecting an intervertebral disk at the apex of the concavity;
injecting a thermoplastic material heated to a temperature over 50 C. for flowing into the annulus fibrosus of said intervertebral disk; and
permitting said thermoplastic material to cool to body temperature of a patient for setting in a non-flowing state while retaining sufficient resilience for cushioning and non-migration.

Claim 11 (original): The process as defined in claim 10, further comprising:

providing an injection device for injecting the thermoplastic material, the injection device having a heating element and a needle for dispensing of the thermoplastic material;

heating the thermoplastic material by said heating element to a predetermined high temperature over 50 C. at which said material flows a desired amount; and

thereafter injecting said thermoplastic material at said predetermined high temperature through said needle for flow into said annulus fibrosus of said selected intervertebral disk.

Claim 12 (currently amended): [[The]] An injection device ~~as defined in claim 4 for~~
injecting thermoplastic material, the injection device comprising:

a heating element and a needle for dispensing of the thermoplastic material into an
intervertebral disk, wherein the thermoplastic material comprises a geometric isomer of natural
rubber.

Claim 13 (currently amended): The injection device as defined in claim [[4]] 12, wherein
said ~~heater~~ heating element heats said thermoplastic material for flowing at a temperature
between about 150C and 200C.

Claim 14 (currently amended): The injection device as defined in claim [[4]] 12, wherein said thermoplastic material comprises a linear crystalline polymer.

Claim 15 (currently amended): The injection device as defined in claim [[4]] 12, wherein said thermoplastic material comprises a gutta percha compound in which gutta percha is between 15% and 40% by weight of the compound.

Claim 16 (currently amended): The injection device as defined in claim [[4]] 12, wherein said injection needle is formed of a ceramic material.

Claim 17 (currently amended): The injection device as defined in claim [[4]] 12, further comprising:

an expandable sleeve about said needle adjacent an extending end of said needle to define an annulus between said needle and said sleeve, so that pressurized fluid communicating with the annulus expands said sleeve outwardly.

Claim 18 (currently amended): The injection device as defined in claim 17, wherein said needle has openings thereon for the supply of a pressurized fluid to said annulus for expanding said sleeve.

Claim 19 (currently amended): The injection device as defined in claim [[4]] 12, further comprising:

a chamber for receiving a plug of said thermoplastic material;

a piston adjacent an end of said plug for exerting a force against said plug; and

a hand operated trigger is operatively connected to said piston and upon actuation is effective to force said thermoplastic material from said needle when said thermoplastic material is heated to a flowing state.

Claim 20 (currently amended): The injection device as defined in claim [[4]] 12, further comprising:

a chamber for receiving a plug of said thermoplastic material; and

a hand operated trigger operatively connected to said plug thermoplastic material and upon actuation is effective to force said thermoplastic material from said needle when said thermoplastic material is heated to a flowing state.

Claim 21 (currently amended): The injection device as defined in claim [[4]] 20, further comprising; wherein:

[[the]] said chamber for receiving [[the]] said plug is provided in a plunger removable from an injection device body.

Claim 22 (currently amended): The injection device [[asa]] as defined in claim [[4]] 12, further comprising;

a heater control unit having an adjustable temperature control to provide a selected temperature for said ~~heater~~ heating element.

Claim 23 (new): The injection device as defined in claim 12, wherein said thermoplastic material comprises a geometric isomer of natural rubber.

Claim 24 (new): A system for treating an intervertebral disk, comprising:

a thermoplastic material capable of being heated to a flowable state at a predetermined temperature above body temperature for introduction into an intervertebral disk and therafter cooling to return to a non-flowable state, and

an injection device having a chamber for receiving said thermoplastic material, a heating element for heating said thermoplastic material to said flowable state, and a needle for injecting said flowable thermoplastic material into an intervertebral disk of a patient.